

REMARKS

Claims 1-12 remain in the application with 1, 3, 5, 7, and 9-12 having been amended hereby.

Reconsideration is respectfully requested of the objection to the claims as containing informalities.

The claims have been amended hereby to more clearly define the synchronizing pattern and the phase shifted synchronizing pattern.

Reconsideration is respectfully requested of the rejection of the claims 1-10 under 35 USC, as being obvious over Keller et al. in view of Olaffson and Sato et al.

As previously noted, the present invention is intended to provide a data modulation system that employs a reference signal inserted into the data symbol for subsequent use in decoding the data. The present invention provides a specialized form of synchronizing pattern employing a first synchronizing pattern and a second synchronizing pattern formed by phase shifting the first synchronizing pattern. These synchronizing patterns are arranged in a time series in a specific structure each of such structures being positively recited in the claims.

This insertion of the special synchronizing pattern structure permits a common receiver to distinguish this waveform pattern from other waveform patterns produced by conventional communication systems.

The claims have been amended hereby to emphasize the above-noted features of the present invention.

The Keller et al. reference discloses the use of a reference symbol consisting of consecutive copies of a synchronization pattern in the time domain, as shown in Fig. 2. Keller et al. is silent concerning the specific synchronizing pattern provided by the present invention.

Olaffson discloses a synchronization routine that employs a preliminary synchronization signal segment that contains repetitive sequence of four symbols defined in a certain symbol pattern. The symbols are disclosed as representing the amplitude so that plus and minus simply relates to a positive amplitude and a negative amplitude. There is no mention in Olaffson of performing phase shifting and no mention in Olaffson of the specific structure of the synchronizing patterns, as recited in the amended claims.

Sato et al. is cited for allegedly disclosing that the reference symbol produces a two peak waveform. Nevertheless, as shown in Fig. 10, the correlation calculator 55 produces successive cross correlation values. These values are then detected in a special selective 57. Thus, the system of Sato et al. produces a successive number of correlation values and not only two peaks, as in the presently claimed invention.

Accordingly, it is respectfully submitted that combining Olaffson and Sato et al. and the Keller article would not have rendered obvious the present invention, as positively recited in the amended claims.

Reconsideration is respectfully requested of the rejection of

claims 11 and 12 under 35 USC 103, as being obvious over Keller et al. in view of Olaffson and Sato et al. and further in view of Kwak et al.

Claims 11 and 12 include the features described above that are not found in the combination of references used in the previous rejection.

Kwak et al. is cited for showing a communication device including an antenna and a synchronization detector.

Nevertheless, Kwak et al. fails to disclose the features of the present invention relating to the specific synchronization patterns provided in a time series and that the reference symbol produces a waveform output having only two peaks when the reference symbol is input to a correlator, as in the presently claimed invention.

Therefore, it is respectfully submitted that claims 11 and 12 are not rendered obvious by the combination of references.


Accordingly, in view of the amendments made to the claims hereby, as well as the above remarks, it is respectfully submitted that a data modulation method and apparatus having specific reference symbol formed of multiple synchronizing patterns aligned at a time series, as positively recited in the claims, is neither shown nor suggested in the cited references, alone or in combination.

Entry of this amendment is earnestly solicited and it is respectfully submitted that this amendment raises no new issues

requiring further consideration and/or search because the amendments simply emphasize the features of the present invention as previously recited in the claims.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,  
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